

Applicants: Linda B. Buck and Richard Axel  
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RI, B. Hind III, C. Bam HI, or D. Pst I, and then electrophoresed on an agarose gel and blotted onto a nylon membrane. The blotted DNA was hybridized to the <sup>32</sup>P-labeled H3/H5 sequence. An autoradiograph of the hybridized blot is shown with the sizes of co-electrophoresed size markers noted in kilobases.

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Applicants furthermore annex hereto, as **Exhibit A**, a marked-up version of the Brief Description of the Figures to show the changes made herein relative to the previous version.

In the claims:

~~Please cancel claims 9-12 without prejudice to applicants' right to pursue the subject matter of these claims in a continuing application.~~

Please amend claims 1, 6 and 8 as follows:

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1. (Amended) An isolated nucleic acid molecule encoding an odorant receptor protein, wherein the receptor protein comprises seven transmembrane domains and a 17-amino acid cytoplasmic loop between the fifth and sixth transmembrane domains, and is further characterized by at least one of the following characteristics:

- (a) the loop between the first transmembrane domain and the second transmembrane domain, and the second transmembrane domain together comprise consecutive amino acids having

the following sequence: -L, X, X, P, M, Y, X, F, L- (SEQ ID NO: 55);

- (b) the third transmembrane domain, and the loop between the third transmembrane domain and the fourth transmembrane domain together comprise consecutive amino acids having one of the following sequences:

-M, X, Y, D, R, X, X, A, I, C- (SEQ ID NO: 57); or

-D, R, X, X, A, I, C- (SEQ ID NO: 59);

- (c) the loop between the fifth transmembrane domain and the sixth transmembrane domain, and the sixth transmembrane domain together comprise consecutive amino acids having one of the following sequences:

-K or R, X, F, S, T, C, X, S, H- (SEQ ID NO: 61); or

-F, S, T, C, X, S, H- (SEQ ID NO: 63); or

- (d) the seventh transmembrane domain and the C-terminal domain together comprise consecutive amino acids having one of the following sequences:

-P, X, X, N, P, X, I, Y, X, L, R, N- (SEQ ID NO: 65); or

-P, X, X, N, P, X, I, Y- (SEQ ID NO: 67); or

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-N, P, X, I, Y, X, L, R, N- (SEQ ID NO: 69);

wherein X is any amino acid.

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6. (Amended) An isolated nucleic acid molecule encoding an odorant receptor protein comprising seven transmembrane domains and a 17-amino acid cytoplasmic loop between the fifth and sixth transmembrane domains, wherein the nucleic acid molecule encodes a protein selected from the group consisting of:

(a) an odorant receptor protein comprising consecutive amino acids having a sequence identical to that beginning with methionine at position 1 and ending with tyrosine at position 333 as set forth in row F3 of Figures 4A to 4M (SEQ ID NO: 71),

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(b) an odorant receptor protein comprising consecutive amino acids having a sequence identical to that beginning with methionine at position 1 and ending with glutamine at position 313 as set forth in row F5 of Figures 4A to 4L (SEQ ID NO: 72),

(c) an odorant receptor protein comprising consecutive amino acids having a sequence identical to that beginning with methionine at position 1 and ending with lysine at position 311 as set forth in row F6 of Figures 4A to 4L (SEQ ID NO: 73);

- (d) an odorant receptor protein comprising consecutive amino acids having a sequence identical to that beginning with methionine at position 1 and ending with glycine at position 317 as set forth in row F12 of Figures 4A to 4L (SEQ ID NO: 74),
- (e) an odorant receptor protein comprising consecutive amino acids having a sequence identical to that beginning with methionine at position 1 and ending with leucine at position 310 as set forth in row I3 of Figures 4A to 4L (SEQ ID NO: 75),
- (f) an odorant receptor protein comprising consecutive amino acids having a sequence identical to that beginning with methionine at position 1 and ending with glycine at position 327 as set forth in row I7 of Figures 4A to 4L (SEQ ID NO: 76),
- (g) an odorant receptor protein comprising consecutive amino acids having a sequence identical to that beginning with methionine at position 1 and ending with tryptophan at position 312 as set forth in row I8 of Figures 4A to 4L (SEQ ID NO: 77),
- (h) an odorant receptor protein comprising consecutive amino acids having a sequence identical to that beginning with methionine at position 1 and ending with leucine at position 314 as set forth in row I9 of Figures 4A to 4L

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(SEQ ID NO: 78),

(i) an odorant receptor protein comprising consecutive amino acids having a sequence identical to that beginning with methionine at position 1 and ending with leucine at position 312 as set forth in row I14 of Figures 4A to 4L (SEQ ID NO: 79),

(j) an odorant receptor protein comprising consecutive amino acids having a sequence identical to that beginning with methionine at position 1 and ending with leucine at position 314 as set forth in row I15 of Figures 4A to 4L (SEQ ID NO: 80), and

(k) an odorant receptor protein that shares from 40-80% amino acid identity with any one of the proteins of (a)-(j), comprises seven transmembrane domains, and is further characterized by at least one of the following characteristics:

(i) the loop between the first transmembrane domain and the second transmembrane domain, and the second transmembrane domain together comprise consecutive amino acids having the following sequence: -L, X, X, P, M, Y, X, F, L- (SEQ ID NO: 55);

(ii) the third transmembrane domain, and the loop between the third transmembrane domain and the

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fourth transmembrane domain together comprise consecutive amino acids having one of the following sequences:

-M, X, Y, D, R, X, X, A, I, C- (SEQ ID NO: 57); or

-D, R, X, X, A, I, C- (SEQ ID NO: 59);

(iii) the loop between the fifth transmembrane domain and the sixth transmembrane domain, and the sixth transmembrane domain together comprise consecutive amino acids having one of the following sequences:

-K or R, X, F, S, T, C, X, S, H- (SEQ ID NO: 61);  
or

-F, S, T, C, X, S, H- (SEQ ID NO: 63); or

(iv) the seventh transmembrane domain and the C-terminal domain together comprise consecutive amino acids having one of the following sequences:

-P, X, X, N, P, X, I, Y, X, L, R, N- (SEQ ID NO: 65); or

-P, X, X, N, P, X, I, Y- (SEQ ID NO: 67); or

-N, P, X, I, Y, X, L, R, N- (SEQ ID NO: 69);

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23 wherein X is any amino acid.

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8. (Amended) An isolated nucleic acid molecule encoding an odorant receptor protein comprising seven transmembrane domains and a 17-amino acid cytoplasmic loop between the fifth and sixth transmembrane domains, wherein the nucleic acid molecule comprises a nucleic acid sequence which can be amplified by polymerase chain reaction using:

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- (a) any one of 5' primers A1 (SEQ ID NO: 37), A2 (SEQ ID NO: 38), A3 (SEQ ID NO: 39), A4 (SEQ ID NO: 40), or A5 (SEQ ID NO: 41); and
  - (b) any one of 3' primers B1 (SEQ ID NO: 42), B2 (SEQ ID NO: 43), B3 (SEQ ID NO: 44), B4 (SEQ ID NO: 45), B5 (SEQ ID NO: 46), or B6 (SEQ ID NO: 47).
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Please add new claims 64 and 65 as follows:

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64. (New) An isolated nucleic acid molecule encoding an odorant receptor protein comprising seven transmembrane domains and a 17-amino acid cytoplasmic loop between the fifth and sixth transmembrane domains, wherein the nucleic acid molecule comprises:

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- (a) a nucleic acid sequence given in any one of Figures 9 to 18 (SEQ ID NOS.: 1-10); or